

CLAIMS

I CLAIM:

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- 3 1. A pharmaceutical composition, comprising a plurality of bone marrow stromal
- 4 cells (MSCs) comprising an adenovirus mediated human BMP-2 gene, and a pharmaceutically
- 5 acceptable polymer.
- 6 2. The composition as recited in Claim 1 wherein the polymer is selected from a
- 7 group consisting of alginate and collagen.
- 8 3. The composition as recited in Claim 1 wherein the MSCs are present in a
- 9 concentration of about 50×10^6 per ml of the polymer.
- 10 4. The composition as recited in Claim 1 wherein the polymer is Pancogene S.
- 11 5. A method of treating a bone or other tissue defect, comprising:
- 12 a. Obtaining a plurality of MSCs from a subject;
- 13 b. transferring a BMP-2 gene to the MSCs to form BMP-2 protein producing
- 14 MSCs; and
- 15 c. implanting the protein producing MSCs to a site on the subject.
- 16 6. The method as recited in Claim 5 wherein the BMP-2 gene is transferred via an
- 17 adenovirus.
- 18 7. The method as recited in Claim 5 further comprising mixing the BMP-2
- 19 producing MSCs with a polymer either before, during or after the implantation of the protein
- 20 producing MSCs.

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1 8. The method as recited in Claim 5 wherein the protein producing MSCs implanted
2 are present in a concentration of about 50×10^6 per ml of a pharmaceutically acceptable polymer
3 and produce an effective amount of the protein.

4 9. A BMP-2 protein at a site of bone or other tissue defect produced by the method
5 of obtaining a plurality of MSCs from a subject, transferring a BMP-2 gene to the MSCs to form
6 BMP-2 protein producing MSCs, and implanting the protein producing MSCs to the site on the
7 subject.

8 10. The protein as recited in Claim 9 further comprising mixing the BMP-2 producing
9 MSCs with a polymer either before, during or after the time of implantation of the protein
10 producing MSCs.
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